“Airing out the Dirty Laundry”

Lessons learned from QI Case Reviews

How frequently do you conduct QI case reviews in your Department?

1. Monthly
2. Quarterly
3. Occasionally
4. Never

Introduction

• IOM Report “To Err is Human”
  – 44,000 to 98,000 patients die yearly as a result of preventable medical errors
  – Lower estimate: more deaths than from MVAs, Breast CA, or AIDS
  – Ongoing questions about veracity of data, but not the problem
Introduction

- Relevance to Emergency Medicine
  - ED: 3% of adverse events
  - 50%-75% deemed preventable
  - Error reduction particularly challenging
  - Concept of “floor” error rate

Errors in the ED

- “Human Error”- James Reason
  - Person vs. Systems approach
  - Sharp and Blunt End
  - Active Failures and Latent Conditions

- “Operating at the Sharp End” -Cook and Woods in “Human Error in Medicine”
  - Knowledge calibration
  - Inert knowledge
  - Cognitive Lockup
Errors in the ED

• ED Environment and possible Risk Factors
  – Shift changes/handoffs
  – Multi Cultural patients
  – Sleep Deficits
  – Culture (“Silos”)
  – Crowding
  – Uncertainty
  – Time pressure

Errors in the ED

• Decision Making Strategies
  – Exhaustive
  – Hypothetico-deductive
  – Pattern recognition
  – Heuristics

Errors in the ED

• Identification of Errors
  – patient complaints
  – MD complaints
  – incident reports
  – deaths
  – unscheduled return visits
  – Malpractice claims

Case Studies: Dyspnea

• 45 yo male with acute SOB awakening him
• PMH: HTN, IDDM, CKD
• EMS: acutely ill, severe respiratory distress
• Rx: High flow oxygen, Lasix, NTG x 3, Morphine, and Albuterol by nebulizer en route to ED
Case Studies

- Meds: Atenolol and Insulin
- Social: 2-3 ppd cigarettes
- Vitals: T 36.8 BP 190/60, P 74, RR 28
- Gen: mod distress on nebulizer
- Lungs: decreased breath sounds bilaterally
- Extr: mild pedal edema

What’s the Diagnosis?

1. ACS
2. Asthma
3. Acute Pulmonary Edema
4. PE
5. Pneumonia
Case Studies

- CXR and ECG read as negative
- FS glucose: 308
- Treatment: Albuterol nebs and steroids given with subjective and objective (peak flow) improvement
- Nurses notes indicate 900 cc urine output
- Dx: New onset asthma
- Home with Rx for Albuterol and steroids

Case Studies

- Radiology→CXR with edema
- Patient called back to ED
- Labs: K⁺=7.0
- Admit Dx: CHF, hyperkalemia, CRF
- Discharged after short stay

Errors in the ED

- What went wrong?
  - Anchoring
  - Cognitive Lockup
  - Time of encounter
  - Poor communication (RN-MD)
  - Delay in over-read by Radiologist

Case Studies: Flank Pain

- 85 yo female
- Acute back pain while playing cards
- Took friend’s NTG
- EMS noted BP of 50 systolic, IV fluids infused en route to ED
- PMH: HTN, CABG, lesion in abdomen
Case Studies

- Vitals signs: T 37.2 BP 118/93 P 71 RR 27
- General: diaphoretic female in mod distress
- Abdomen: obese, soft, non-tender, no mass
- Back: R>L flank tenderness
- Pulses: femoral palpable, no pedal pulses
- Skin: cool

Case Studies

- IV fluids, blood/urine, CT scan ordered
  - Normal bedside Hgb
  - Urine positive for blood, LE
- CT obtained (3 hours later)
Case Studies

- CT scan: leaking dissecting AAA
- Vascular Surgery notified
- To OR for repair
- Cardiac arrest on table; expired

Errors in the ED

- What went wrong?
  - Representativeness
  - Lack of information (diversion)
  - Poor communication (RN-MD)
  - Delays in imaging and prolonged imaging

Case Studies: Abdominal Cramps

- 62 year old female
- abdominal cramping, emesis, and loose stools
- ROS: fevers, chills
- Had eaten poultry prior to onset of illness.
- PMH: HTN, no past surgical history.
- RN notes: pain and tenderness in RLQ

Case Studies

- Vitals: T 37.2 BP 135/73 P 64
- Gen: no distress
- Abdo: diffuse mild tenderness, non-surgical
- Heme - stool.
Case Studies

- Rx: Morphine and Compazine given
- WBC: 11,000
- ECG: normal
- Dx: Colitis
- Dispo: Home with Vicodin and Compazine
- Follow up with PMD and return prn

Case Studies

- Return visit to ED 2 days later
- Ongoing pain in spite of ATC Vicodin
- T=39.0
- Exam: diffusely tender abdomen, increased in RLQ with guarding
- CT scan obtained

Case Studies

- OR: perforated appendix
- 6 day hospitalization
- Persistent pain and wound problems
Errors in the ED

- What went wrong?
  - Availability
  - Poor communication (RN-MD)
  - Time of encounter
  - Difficulty making contact with primary MD

Case Studies: Fall

- 82 year old non-English speaking female
- Fall at home on the evening prior to visit injuring her left shoulder
- No significant PMH
- Vitals: T 37 BP 163/101 P 66 RR 16
- Gen: patient ignoring examiner (baseline per companion)
- Shoulder: tender with decreased use of left arm

Case Studies

- Work up: ECG: NSR, no acute findings.
- Shoulder Xray: distal clavicle fracture
- Dx: Fall with Clavicle fracture
- Dispo: Home with Sling and FU primary MD

Case Studies

- Patient returned to ED next day
- Family: patient ignoring left side and less responsive than normal
- Monitor: afib with RVR.
- Exam: left sided-neglect and weakness
- Head CT obtained
Errors in the ED

- What went wrong?
  - Language barriers
  - Visceral bias
  - Positive finding (fracture) lead to premature diagnostic closure: search satisficing
  - Inert knowledge re stroke syndromes

Case Studies: Abdominal Pain

- 39 y/o female
- LLQ pain radiating to right side for 1.5 days
- Exacerbated by eating, assoc. nausea
- ROS: no vomiting or diarrhea
- LMP 2 weeks prior
- New partner, unprotected intercourse

Case Studies

- Vitals signs: T 37.7 BP 111/67 P 66; pain 10/10
- Gen: lying still secondary to pain
- Abdo: decreased BS, mild diffuse tenderness
- Gyn: no CMT, bilateral tenderness, no mass
What’s the Diagnosis?

1. Appendicitis  
2. Diverticulitis  
3. Ectopic pregnancy  
4. Ovarian torsion/TOA  
5. Ureteral Colic

Case Studies

- IV/Labs/Urine requested
- Morphine for pain
- Labs: WBC: 12.1 Hct: 35%
- Unable to provide urine specimen (pain)
- 4 hours later, urine obtained->discarded
- MDs aware, add on quant Beta-HCG

Case Studies

- Beta-HCG: 958
- ED US performed: free fluid in abdomen
- Patient now dizzy and orthostatic
- Stat Gynecology consult and US performed
Case Studies

• US: 6x4 cm left adnexal mass
• Repeat Hcts: 28%-16%
• OR: ruptured ectopic pregnancy, left salpingectomy, hemoperitoneum
• 4 units of blood transfused
• Discharged home in good condition

Errors in the ED

• What went wrong?
  – Anchoring
  – Crowding
    • Delay in exam (hallway)
    • Delay in order execution
  – Poor communication (MD-RN-staff)

Case Studies: Chest Pain

• 60 yo male
• Complains of sharp, burning CP x 2 hours
• Onset at rest (early am)
• Radiates to back and left axilla
• PMH: Depression
• Social: 40 pack-year cigarette smoker
• FH: Father: MI at age 49
Case Studies

- Vitals: T 37 BP 192/100 P 68 RR 18
- Gen: smiling conversant, no distress
- Lungs: clear, no rales
- Heart: RRR
- Abdo: soft, NT
- Extr: no edema noted

CXR: normal
Bilateral UE BPs: equal
NTG and ASA given: no change in symptoms
GI cocktail: relief
Troponin: negative

What’s the Diagnosis?

1. ACS
2. Anxiety-panic attack
3. Aortic Dissection
4. Chest Wall pain
5. GERD
Case Studies

- Unscheduled return 2 days later
- Arrives in severe distress with dyspnea
- Hypotensive (60 systolic) and mottled
- Rapid fluid and pressor infusion
- Intubated and ECG obtained

- Bedside Echo: no aneurysm or dissection, large pericardial effusion seen
- Urgent cardiac cath: pericardial tamponade and occluded LAD, bloody pericardial fluid
- Patient stabilized then succumbed 2 days later from PEA arrest
- Autopsy: transmural MI with LV rupture

Errors in the ED

- What went wrong?
  - Positive finding (response to antacid) lead to cessation of search- “satisficing”
  - Premature diagnostic closure
  - Role of psychiatric history and bias
  - Lack of an algorithmic approach to chest pain
Summary

- Communication failures
- Execution failures
- Algorithms not in place
- Environmental: crowding, lack of info
- Outpatient care hard to access
- Fatigue
- Cognitive Failures

System Solutions

- Case Reviews
  - Most “bang for the buck”
- Algorithms
  - For common clinical scenarios
- Teamwork Training
  - From Airlines: CRM
- Simulation
  - Low or High Fidelity
- Crowding
  - ACEP Boarding Task Force Report

Cognitive Solutions

- Self Assessment
- Reflection
  - Critical self analysis to improve results
  - Deliberate process
- “The Reflective Practitioner”: Schon
  - Knowing in action
  - Reflection in action
  - Reflection on action
Reflective Questions

- React: how could I change my practices, given the settings and aims, to improve the results?
- Reframe: how could I change the aims, i.e. my view of the task, as well as my view of myself and the other participants in the setting, to improve the results?
- Redesign: how could I change my cognitive model, or aspects of the environment (setting or system), to improve the results?

Cognitive Solutions

- Forcing Functions
  - Device engineering
- Cognitive Forcing Strategies
  - Cardinal rules to avoid pitfalls
  - Generic and specific

Conclusions

- Errors happen
- EM particularly at risk
- May be preventable
- Systems and cognitive solutions available
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